

INFORMATION REPORT INFORMATION REPORT

CENTRAL INTELLIGENCE AGENCY

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COUNTRY	Poland	REPORT	
SUBJECT	1. Polish and Soviet Mechanization of Labor in the Construction Field	DATE DISTR.	14 NOV 1958
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A report containing information on (1) Polish and Soviet mechanization of labor in the construction field and (2) the packaging of bricks and cement in Poland

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ARMY review completed.

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STATE	#X ARMY	#X NAVY	#X AIR	#X FBI	AEC				
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REPORT

COUNTRY Poland

DATE DISTR²⁴ JULY 1958

SUBJECT 1. Polish and Soviet Mechanization of Labor
in the Construction Field
2. Packaging of Bricks and Cement in Poland

NO. OF PAGES 10

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THIS IS UNEVALUATED INFORMATION

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POLISH AND SOVIET MECHANIZATION OF LABOR, AND PACKAGING OF BRICKS AND CEMENT (c)**Introduction**

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only
the most labor consuming work was being mechanized to any great extent in Poland and the Soviet Union and that one should expect the development of mechanization in construction to be higher than in most other fields.

The information on Polish and Soviet progress with modern methods of packaging gives some insight into the difficulties encountered in their adoption. Although the information concerns Poland, many of the same problems were encountered in the Soviet Union, especially in the use of the two pallet containers for bricks which were developed by the Soviets.

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The paper shortage in Poland led to experimentation with the new methods of packaging the ever increasing cement supply. the only significant evidences of modern packaging in Poland were those mentioned in this report.

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modern methods of packaging were well integrated there. The Soviet Union had no paper shortage.

A. MECHANIZATION OF LABOR IN POLAND AND THE SOVIET UNION**1. The Need to Mechanize**

Soon after WW II, Poland realized that mechanization was the only answer to her shortage of labor which was intensified by the need for reconstruction. however, Poland was only in the beginning stages of mechanization, and many phases of work were still being done as they were 25 years ago. The main problem was not the lack of technological knowledge but a lack of money to buy or produce the machinery and equipment essential for mechanization. For this reason, Poland had begun mechanizing only the heaviest and most labor consuming work.

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2. Mechanization of Construction

Several surveys were conducted during this time which compared Polish mechanization of construction with that of the Soviets figures on Soviet coefficients of mechanization were used in the comparison between the two countries. From these surveys coefficients of mechanization were established and used by the Polish government in establishing norms of construction, such as size of work force, duration of construction time, and others. These coefficients dealt with transport (vertical, horizontal, and diagonal), and earth working (cutting, loosening, grading, scraping, and plaining, transport, dumping, and compressing).

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a. Polish Coefficients of Mechanization in Construction¹

The following coefficients of mechanization in construction were included in the Polish Construction Plan (Plan Budownictwa) for 1957, by the Ministry of Construction and Building Material Industry. They were based on the prime machine or machines (dla Prowadzacej Maszyny).

(1) Transport (within the construction site)**(a) Coefficients of Vertical Transport.**

95% - - - - - Mechanized

35% - - - - - by crane

60% - - - - - by power lift

5% - - - - - by hand

(b) Coefficients of Horizontal Transport

50% - - - - - Mechanized

35% - - - - - by crane

15% - - - - - conveyors, fork lift trucks, etc.

50% - - - - - by hand - wheelbarrows, carts,
etc.**(c) Coefficients of Diagonal Transport²**

35% - - - - - by crane, conveyor, etc.

65% - - - - - by hand, wheelbarrows, packs, etc.

(2) Earth Working**(a) Coefficients of Cutting and Digging**

51% - - - - - power shovels

49% - - - - - by hand

(b) Soil Loosening18% - - - - - bulldozers (other mechanized
equipment)

82% - - - - - by hand

(c) Grading, Scraping, and Planing

8% - - - - - by graders, scrapers

92% - - - - - by hand

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- (d) Horizontal Transport of Earth
- 50% - - - - - by truck (20% dump trucks, 30% normal flat beds)
- 30% - - - - - by rail
- 17% - - - - - horse-drawn wagon
- 3% - - - - - by hand, wheelbarrows, carts
- (e) Dumping or Unloading
- 20% - - - - - by dump truck
- 80% - - - - - by hand
- (f) Earth Compressing
- 15-20% - - - - - bulldozers, rollers
- 80-85% - - - - - by hand

b. Soviet Coefficients of Mechanization in Construction

The following coefficients of mechanization in construction were included in the Soviet Construction Plan for 1957. These figures were based on the prime machine or machines.

- (1) Transport (within the construction site)
- (a) Coefficients of Vertical Transport
- 85% - - - - - by crane
- 15% - - - - - by power lift, by hand³
- (b) Coefficients of Horizontal Transport
- 85% - - - - - cranes
- 15% - - - - - all other means - fork lift trucks, conveyors, and by hand
- (c) Coefficients of Diagonal Transport
- 85% - - - - - cranes, conveyors
- 15% - - - - - by hand - wheelbarrows, lifts, etc.
- (2) Earth Working
- (a) Coefficients of Cutting and Digging
- 78% - - - - - power shovel
- 22% - - - - - by hand
- (b) Soil Loosening
- 60% - - - - - bulldozers
- 40% - - - - - by hand

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(c) Grading, Scraping, and Planing

40% - - - - - graders, scrapers

60% - - - - - by hand

(d) Horizontal Transport of Earth

75% - - - - - truck (60% dump trucks, 15% normal
flat bed trucks)

20% - - - - - by rail

4% - - - - - by horse-drawn wagon

1% - - - - - by hand

(e) Dumping or Unloading

60% - - - - - by dump truck

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40% - - - - - by hand

(f) Compressing of Earth

60% - - - - - rollers, bulldozers

40% - - - - - by hand

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3. Distribution of Equipment

[] there was a tendency to concentrate masses of equipment on a few large land projects. This was especially true in the Soviet Union, where great pains were taken to appear highly mechanized for propaganda purposes. the Soviet Union [] had [] construction sites in several big cities which appeared to have too much equipment.

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[] there were construction sites in the USSR which were not well supplied with modern equipment (locations unknown).

In Poland, however, there was not so much concern about displaying equipment for propaganda purposes. [] when there was a large concentration of equipment in Poland, it was probably because of the priority of the work.

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B. PACKAGING IN POLAND (KONTENERYZACJA)**1. History of Packaging in Poland**

Poland made very little progress in modern methods of packaging up to 1957. There had been several attempts to introduce modern packaging to Polish industry, but with little success. The main obstructions to the complete adoption of modern methods were both a lack of money to completely reorganize systems of manufacture, transport, material handling and storage, and the tremendous job of retraining workers.

In 1953, the then State Economic Planning Commission (now the Planning Commission of the Council of Ministers - Komisja Planowania przy Radzie Ministrow) passed a bill making packaging of bricks mandatory for all brick manufacturers in Poland. Starting in 1954, it was planned to slowly integrate the process. To introduce the new methods, ten brick factories were designated to supply about

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ten construction sites with bricks in pallet containers. These ten brick factories were in four general areas; WARSAW, POZNAN, KRAKOW, AND KATOWICE. The experiment was generally unsuccessful due to the shortage of pallet containers; shortage of equipment and machinery necessary to mechanize the process; and the objection to the change in routine methods within the factories by the workers. At the same time, however, there were other brick factories that voluntarily started their own programs of packaging. They attained some degree of success due to better organization and coordination, which they worked out themselves to fit their own situations. Through these series of successes and failures, the government stopped the program of forced integration of packaging methods. It appeared as though the factories were working out their own local problems and taking their own time. In spite of the fact that it was a law to adopt brick packaging, most of the factories in Poland up to 1957, had not yet adopted it. [] it would take many years just for this one modern method to become fully integrated, unless the government started a new program of pressured acceptance. If, however, a new program was started, [] it would include grants of money, machines, and equipment necessary to each factory for the complete and immediate change over. [] this was not very likely in the near future because of the cost. In spite of all this, there were some factories (exact factories unknown) which used these packaging methods in 1957, [] gradually they would be accepted and adopted.

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There were two types of pallet containers used by Poland and the Soviet Union. One was the Malcew and the other Szyrkow;⁴ both were named for the Soviet engineers who developed them. [] they are the only brick pallet containers in use in Poland and the Soviet Union.

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2. The Brick Pallet Container - Malcew (See Annex A)

The Malcew was developed in 1945 by a Soviet engineer of that name. It was first used in Poland in 1954 and was the only container which received significant use in Poland. It was a square, cage-like container, designed to hold 64 bricks of the Soviet standard size or the Polish standard size (See Annex B for sketch and dimensions). The dimensions of the container were 55 x 55 x 60 cm. It had a wooden pallet base (some pallets were covered with sheet metal). The four metal corner posts were braced laterally by metal slats. The top was braced with three parallel braces and one intersecting brace. In the center of the top was a fixed metal ring by which the container was lifted. One of the sides was hinged to open for access to the bricks. The bricks were loaded 16 to a layer, 4 layers high (See Annex B for sketch of stacking method). The loaded container weighed 260 to 280 kg, or about 600 lbs. (Each brick weighed 4 to 4½ kg). These containers were used for short and long distance shipment and resulted in great economy of bricks. Because they were too heavy to be handled by hand, cranes were required both in the brick factories and at the construction sites. The lack of cranes was one of the limiting factors in the use of such a container on any wide scale in Poland.

All of the factories using this packaging method made all of their own containers from scrap metal, or shared in the manufacture with a construction enterprise which was to be supplied with bricks in the Malcew containers. Generally, the construction enterprises had cranes and much preferred to receive the bricks in containers because of the ease of transport, economy of bricks, and time saved in loading and unloading.

3. The Brick Pallet Container - Szyrkow (See Annex C)

The Szyrkow was nothing more than a pallet with four lifting rings. It was developed in 1956 in Russia by an engineer of that name. It had many advantages over the Malcew; it was cheaper to produce; it could be made in many

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sizes to fit any truck bed; and when empty, it did not take up so much space. By 1957, the Szyrkow was used almost entirely by the Soviets. In Poland, however, it was used very little because the Malcew was still in the beginning stages of use when the Szyrkow was introduced. The Szyrkow was developed from the theory that the only time that sides are necessary is when the container is being lifted. To accommodate this need, the Soviets devised a special crane attachment which braced the load while it lifted (See Annex C for sketch of the crane attachment). The attachment braced the load from the sides and hooked into the four rings on the pallet. The four braces of the crane attachment were hinged so that they could be moved for hooking and unhooking. Each size Szyrkow had a special crane attachment. The most common size (standard) Szyrkow was about 110 x 165 cm, and was built to accommodate as many as 1,536 bricks (4 layers with 16 x 24 bricks or 384 bricks to a layer) which weighed about $7\frac{1}{2}$ tons. It was most commonly used, however, with only two layers of bricks. The only limiting factors in the use of the Szyrkow were the capacity of the carriers and the lift capacity of the cranes available. [redacted] if the Poles were to adopt the Szyrkow, it would be a smaller type that would not require carriers or cranes with such great capacities.

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[redacted] the Soviets had developed a special ZIS carrier with trailer (description unknown) for use with the Szyrkow container.

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4. Cement Packaging

For many years, Poland packaged cement in paper bags. However, an ever increasing shortage of timber caused a shortage of pulp for use in paper production. Adding to this critical situation was the fact that cement production was increasing each year. The cement production for 1958 was set at 4,000,000 tons, and it was planned to reach 6,800,000 tons by 1960. [redacted] there was a sufficient supply of paper to package only 4,000,000 tons of cement. The real crises would develop in the years to come.

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This situation was foreseen as far back as 1954, when a Polish delegation was sent to [redacted] to observe the [redacted] method of transporting cement by truck-mounted cisterns. These cisterns had a capacity of three tons and were made of either metal or wood. The Polish engineers were very impressed with this method of transport and in 1957 the Polish government signed a contract with the [redacted] for the purchase of ten cistern trucks (type unknown). [redacted] they would arrive in Poland sometime in 1958. The Poles considered this to be the only real answer to their problem. Besides the ten trucks, the Poles also purchased the pattern for the wood cistern which they planned to manufacture themselves. (location of manufacture unknown.) [redacted]

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Comments

2. [redacted] this was a relatively new coefficient in use in Poland. It was included in the Construction Plan, for the first time in 1956.

3. The Soviets did not count the power lift as mechanization, but the Poles did.

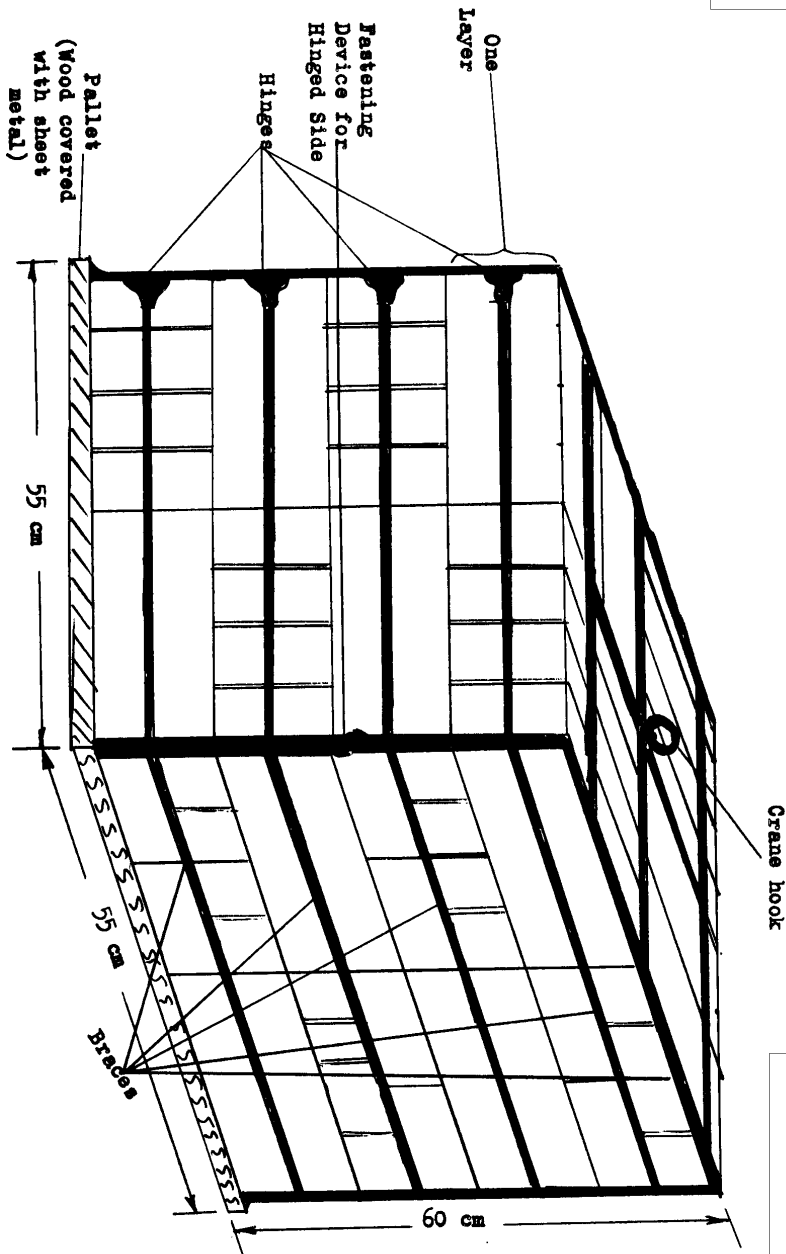
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Annex A

Diagram of the Malcev Brick Container

Crane hook

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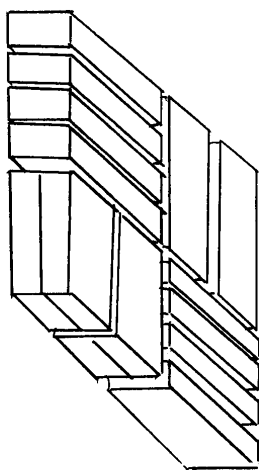
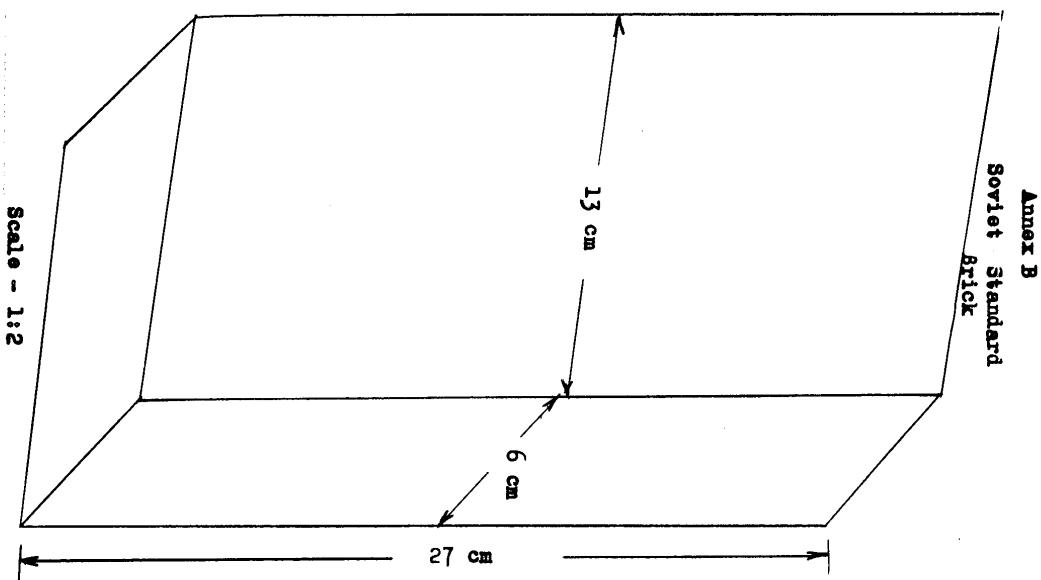
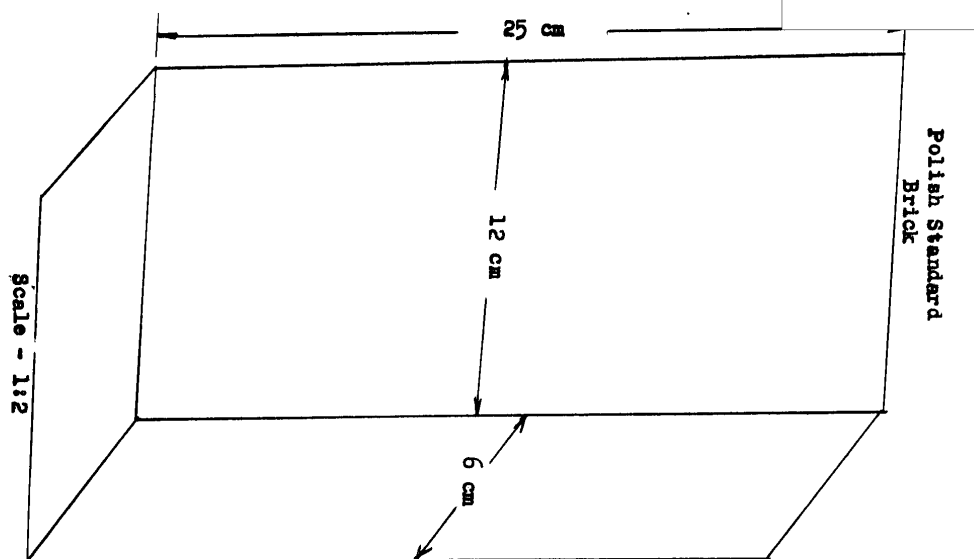


Diagram showing one layer of bricks and method of stacking

NOTE: The Soviet Standard brick size was the old Polish size [redacted] The Soviets also used the new Polish size but far less than they used their own.

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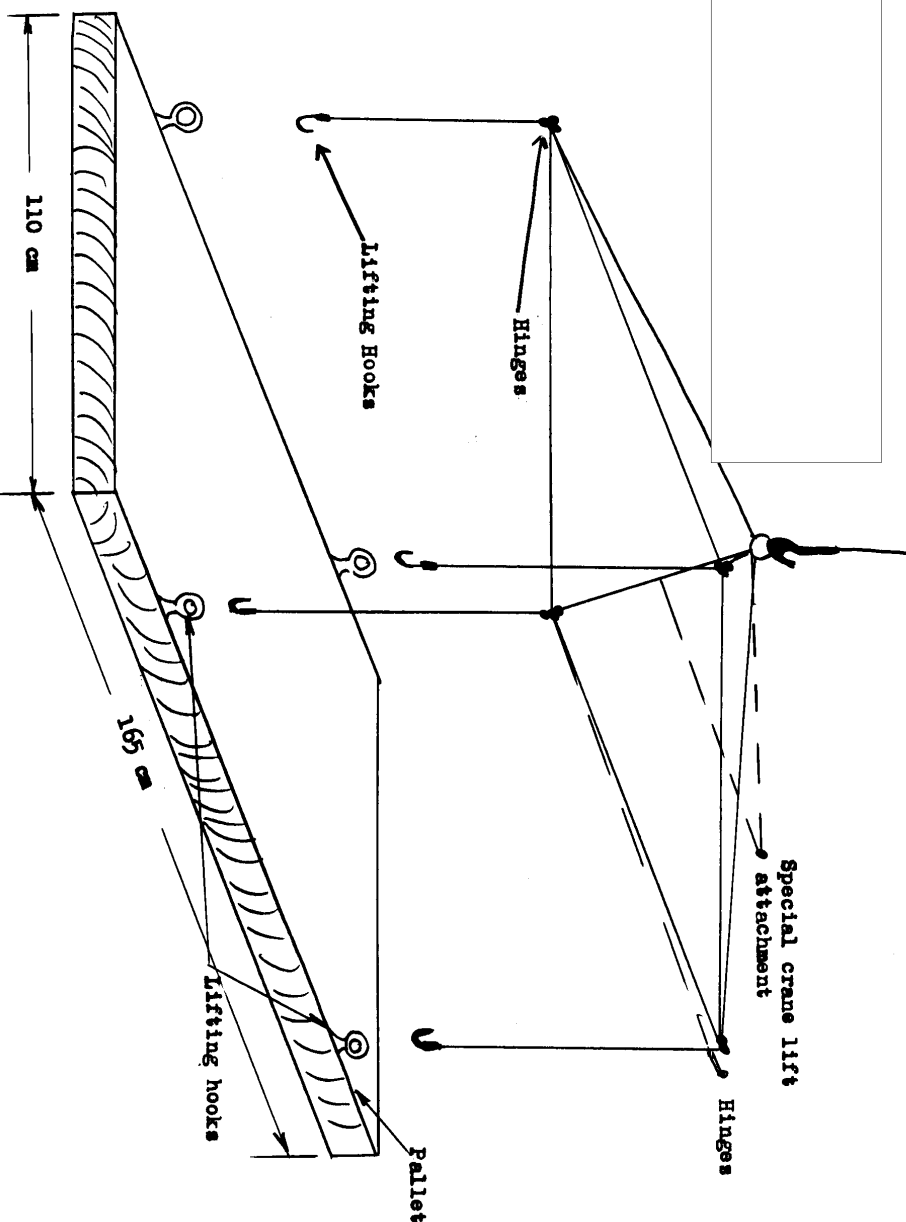
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Annex C

Diagram of the Strykov Brick Pallet Showing Special Lift Device



NOTE: Bricks were stacked to a maximum of four layers, 364 bricks to a layer. Area of one layer was composed of 16 bricks by 24 bricks. Dimensions shown here are of the most commonly used size.

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